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SPECIAL SUBSECTION COMMENTARY

Commentary on "From Baby Doctor to Witch Doctor"

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HIGHLIGHTS

Non-physical beings, such as those considered in spirit releasement therapy, could conceivably exist without contradicting modern physics.

KEYWORDS

Standard model, elementary particle theory, subtle bodies, subtle realms, non-material realms, dark matter, other universes.

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PLATINUM OPEN ACCESS

INTRODUCTION

The Target Article by Tramont (2023) is probably at, or beyond, the "boggle threshold" of most people, even many readers of this *Journal*. I believe that may be the reason the Editor-in-Chief asked me, a physicist, to comment on it. In particular, I suspect he, and readers, wonder if the things Tramont reports are, in fact, possible. More specifically, does modern science, particularly physics, refute such things unequivocally or not? Is there any opening, in our most fundamental and material-centric science, by which the non-material entities described by Tramont could actually exist?

There are two levels to this question: (1) According to physics, can trans-physical levels of creation, replete with intelligent beings, exist? and (2) Do some of these levels actually exist and contain entities like those described by Tramont? The second of these questions I am in no position to answer. The first, I address herein. I discussed a closely related issue in Klauber (2000). The reader may wish to read that article in tandem with this one.

In the interest of full disclosure, I note that, though I am a physicist, I am not a materialist. Ontologically, though ultimately agnostic regarding the essential nature of our existence, I lean towards idealism, which I believe best resolves thorny philosophical issues such as the hard problem of consciousness, and which comprises the simplest explanation for certain experiences I have had. But my personal feelings in that regard should play little role in addressing the physics related to question 1 above.

SOME PHYSICS BACKGROUND

The idea that no two objects can occupy the same place at the same time lies at the foundation of the belief, by many, that ghosts, spirits, and the like cannot possibly be real. After all, the thinking goes, can anything which purportedly passes through doors and otherwise cohabits the same space as other objects in our world possibly exist?

Scientifically, this perspective is so nineteenth-century. Since the dawn of quantum mechanics a hundred or

so years ago, we have known that elementary particles of matter are actually wavelike and that two or more waves can readily occupy the same region of space at the same time. When doing so, they may or may not, interact with one another. In the former case, the waves/particles exert a force between themselves and thereby exchange energy, momentum, and possibly other things we won't delve into here. In the latter case, no force is exerted, and the waves/particles simply co-exist and remain unchanged.

When large numbers of microscopic waves/particles exert forces between themselves, the force can manifest macroscopically. This is what typically happens in the world as we experience it. The waves/particles making up my hand do not pass through the computer mouse I am currently touching, because the enormous number of electron waves in my hand and those in the mouse exert many small forces against one another. These add up to keep my hand on the surface of the mouse and not interior to it.

But, there are exceptions. You may have heard something to the effect that a trillion or so neutrinos (one type of elementary wave/particle) pass through your body every second. Yet, you feel nothing. The reason is that the neutrino waves, for all intents and purposes, do not interact with (exert force on or "collide" with) the normal matter-type waves in your body. To be precise, they interact so slightly that only very rarely, perhaps a handful of times during your lifetime, do they actually collide. You don't feel these occasional occurrences because each collision (interaction) is with only one-minute wave/particle in your body out of trillions upon trillions of them.

There is actually another type of neutrino that doesn't interact at all with our world. (Gravitational interaction excepted, but that is so slight, it is far, far below the level any measurement we could carry out could detect.) The point is, our theory tells us that waves/particles exist that are truly "ghostlike". They pass through doors, people, and the entire planet with ease.

The difference between waves/particles that interact with one another and those that don't have to do with what is called "coupling". Are the two particle types coupled to one another or not? If they are not, nothing happens. The waves/particles remain inviolate and unaltered. If they are, the coupling can be robust (like between the electrons in my hand and those in the mouse) or feeble (like the first type of neutrino described above and the waves/particles in our bodies). Robust, feeble, or no coupling at all – the degrees to which waves/particles can interact (exert force on one another).

Beyond the degree of interaction *strength*, there is interaction *type*, of which there are four known to modern physics. The former is a quantitative distinction; the latter, is qualitative. Two of the types, the electromagnetic and gravitational interactions, are familiar in our macroscopic world. Two, the strong and weak forces, are predominantly subatomic.[1]. The entire physical universe, as we know it, was created, and is driven and maintained, via these four types of interaction.

So, we have a group of elementary particles (electrons, neutrinos, quarks, photons, and a few others) that interact with one another via four types of forces, to varying degrees. That is the essence of the world we know, see, touch, and feel. The nature of that world is determined by the nature of the coupling each of the elementary particle types has with the four different forces. The theory describing these particles and the four forces is called the *standard model*.

In the standard model (Klauber, 2021), quarks are coupled to (interact via) all four forces: electrons via three of them, one type of neutrino, via two; and the other, via one. Some of these couplings are robust. Some are feeble. Some are zero, as in the cases of one coupling type for the electron and two or three for neutrinos. If these couplings were different in quality or strength, our universe, if it could even exist, would be much, much different.

DARK MATTER AND DARK ENERGY

Few readers of this article have not heard of dark matter and dark energy—the hypothesized invisible "somethings" that make up 95% of the mass-energy content of our universe, but of which, we know little. We cannot see either, but we can detect them from the gravitational effects they have on the universe via supernovae, motions of galaxies, and the cosmic microwave background radiation, the leftover light from shortly after the Big Bang. They do not interact with our world, at least to any degree that we have been able to measure, via any of the three non-gravitational forces. Their electromagnetic, weak, and strong couplings are either extremely feeble or zero.

Dark matter, though invisible, acts like normal matter in the sense that it attracts other matter. Dark energy, on the other hand, acts like anti-gravity in the sense that it repels normal matter. No one knows of what they are made, but not for lack of trying. Huge sums of money, and extraordinary amounts of time and effort, have been spent in attempts to detect dark matter particles and determine what they are. All such efforts have, to date, come up empty.

Dark matter particles are more ghostlike than neutrinos. We have yet to find any way they interact with normal matter other than gravitationally. They pass through us all the time, but we are totally oblivious to them. So, what could they be?

In the early days of dark matter detection research, there were several candidate particles, cousins of standard model particles, going by such names as WIMPS, Wimpzillas, lightest SUSY particle, micro charged particles, and axions. (Understanding what these terms stand for is not necessary for this article.) Experiments so far have cast doubts on the viability of the first three of these, and little experimentation has been done for the fourth or fifth.

There is growing concern among elementary particle physicists that dark matter may only interact gravitationally, in which case, we could never detect it via experiments on Earth or in space. In such a case, we would never know much more than we know about it now– that it is some otherwise mysterious particle type coupled to our known universe solely through the gravitational force.

However, there is an intriguing wrinkle on this perspective that has garnered rudimentary, though growing, interest in the physics community. It segues us into the central point of this article.

POSSIBLE DARK MATTER WORLDS

Some (e.g., Loeb, 2022) have suggested that dark matter may not be a single particle but a family of particles that (other than gravity) do not interact with our known universe, but do interact with one another. In other words, (other than gravity) dark matter is not coupled to standard model particles, but instead, has its own types of interaction that only work between dark matter particles. There could be three, or four, or five, or whatever different types of interactions. These could then, independent of us, form their own universe, with dark matter stars (Sutter, 2023), planets, and possibly even living things. Such living things could evolve into intelligent beings, never aware of our presence, even though we would occupy the same space as them, at the same time. They would never be aware, that is, until perhaps one day when they notice gravitational effects from our universe on theirs. For them, we would be the "dark matter". Those in their universe and those in ours would have some dim awareness of the other's existence, but never much more than that. Each would be ghostlike for the other.

PHYSICS AND SUBTLE REALMS

This all opens up an enormous range of possibilities. Imagine, for example, a family of particle types different from those with which we are familiar, which are completely uncoupled from the four forces of the standard model, even from gravity. They would have their own set of interactions, their own "standard model", which generated its own universe, independent of ours. And this universe could well spawn intelligent species.

If this could happen once, why not many times? Why not a near-infinite number of times? Untold universes, unfolding, whose inhabitants have no, or perhaps at best dim, awareness of any of the others.

> If there is one such other family, why not many? If the universe favors anything, it favors unimaginably large numbers. Since, as we suppose, there are an uncountable number of galaxies (including those beyond our horizon of visibility) and, as many theorists propose, an uncountable number of other possible universes, then why not an uncountable number of other independent particle families? In the very place where you, the reader, now sits, there may now also sit a near-infinite number of other sentient beings, some of whom might also be pondering the sensory limitations of their particular version of [the standard model] (Klauber, 2000, p. 278)

Now imagine that one or more of these other worlds is somehow slightly coupled to ours. Perhaps something on the order of one-thousandth or one-millionth the coupling strength of the electromagnetic force (Hagelin, 2005). Maybe this other realm (or realms) and ours shared a common genesis, born at the same time and evolving together, with intermittent interplay between them.

This coupling, as Hagelin (2005) and I (Klauber, 2000) suggest, might somehow be tied in with consciousness. Some beings might be endowed with, or learn, the ability to modify certain interactions (strength, type, number of particles, etc.) such that they could, at least at times, impact other worlds in some manner. They might connect via interaction types that are only activated through consciousness. Or they may have subtle bodies (astral, causal, or other), which some literature links to consciousness itself, composed of particles that, due to their coupling types and strengths, cause such bodies to seem otherworldly to us. Such beings could be like those Tramont describes - ethereal, but not totally so.

And why not other concepts beyond those of spirits, angels, astral planes, subtle bodies, and ETs, such as heaven and hell, near-death tunnels, auras, and other "dimensions." Why not?

THE BOTTOM LINE

I conclude by first citing my own words (Klauber, 2000, p. 279):

> *... note we certainly have not proven that subtle realms [with living agents such as Tramont de-*

> *scribes] actually exist. Yet we must bear in mind that in the long history of mankind's numerous metamorphoses in paradigm, the universe has repeatedly surprised us by being far more extraordinary and expansive in every regard than we had previously imagined (or even, as some have said, than we can imagine.) Given such a history, it would seem prudent to proceed carefully and without prejudice in matters of purported metaphysical nature, and draw conclusions based on empiricism alone. In particular, no proponent of materialism should ever denounce as scientifically indefensible, claims made by others regarding the possible existence of non-physical realms [or beings]. As we have seen, modern physics imposes neither a limit on the probability for the existence of such transcendental [entities], nor restrictions on their nature, total number, or ultimate extent.*

In short, yes, the existence of living beings such as those described by Tramont is possible. They are not precluded by extant theories of physics.

ENDNOTE

1. We use the words "feeble" and "robust" herein to designate relative strength between forces. Hopefully, this will minimize confusion with the use of the words "weak" and "strong" in elementary particle theory to distinguish between *types* of interactions. As one might surmise, the weak force is generally less robust than the strong force. The electromagnetic force is quite robust; the gravity force, quite feeble.

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